Potential Energy Savings

Evaluation of Energy Savings, Payback, and Net Present Value based on September 10 CEC Draft Regulations for Appliance Battery Chargers.

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1. There are many different configurations of external power supplies (EPS) and battery chargers (BC). Despite the differences, all different configurations are required to be tested and evaluated according to the proposed CEC test procedure.

2. CEC has acknowledged that battery chargers represent a distinct category from EPS's but has chosen to include the adapters for appliance battery chargers in the draft regulation.

3. The appliance battery charger products are represented by rechargeable cleaning appliances, other household appliances and value power tools.

4. Of this category of products that fall within the CEC definition, approximately 75% may not meet the proposed CEC regulation limit due to no-load requirements exclusively. The proposed CEC limit for no-load energy consumption is 0.5 watts.

5. For the products that fall within the CEC definition, most are typically detached from the charging source only during use. Since discharge currents are usually much greater the charge currents, the duty cycle of use (and therefore no-load) total time is less then 5%.

6. The no-load power measured for these products is less then 1 W. Since the limit in the regulation is 0.5W for those adapters rated at 10 W or less, the **best case** average power savings for this proportion of units is 0.05*0.5W or 0.025 W/unit. Or, another way to say it would be that for 75% of the battery rechargeable products faced with no-load energy regulation, the most energy that could be saved by compliance with the proposed regulations is 0.025 Watts per unit.

7. Of the remaining 25% of products, approximately 20% may not meet the CEC proposed regulation due to the active mode or combined active and no load regulations. As we have pointed out in the past, the proposed CEC test procedure requires battery charger manufacturers to test their unit at load points which the produce does not ever see in its usage. Battery chargers of this type, by their very nature operate at a single load point that is usually different that the power value computed by the test method based upon nameplate values.

8. In most cases the actual charging load point is about 1W or less. This results in the lowest permitted efficiency according to the table in the proposed CEC

regulation. These adapters are usually designed such that they exhibit the highest efficiency at the charging load point. In nearly all the cases where the active mode efficiency is the reason for not meeting the CEC regulation, this is due to the average of the efficiencies (as required by the test method) being below the limit. This has to do with the issue we raised at October 13, 2004 hearing about the difference between the rating plate Watt value rating and where the unit actually operates. In these cases there would be **no energy benefit** to the consumer during use as a result of the regulation.

9. Only a small number of cases (perhaps 5%) that might not meet the proposed regulatory limits might be changed to actually result in an improvement of efficiency at the load point employed by the battery charging circuit. We estimate in this case that there would be no more then a 5 percentage point improvement in efficiency required to meet the regulation. Assuming an average 5W load this results in an average 0.25 W savings to the consumer.

10. Summarizing the consumer benefit

Case that is effected by regulation	Percent effected	Consumer power savings	Weighted annual energy savings (kWh)	PV of energy savings to consumer over 7 years
Failure due to no-load only	75%	0.025W	0.164	$0.115
Failure due to active mode efficiency other then load point	20%	0W	0.0	$0.00
Failure due to active mode efficiency at load point	5%	0.25W	0.110	$0.077

Total Net Present Value cost benefit to consumer over 7 years = $ 0.192

Note: The 7 year PV rate for energy is from the original CASE study
Note: We have used the 7 year life assumption even though product life for these integral battery products is often less.

11. The adapters that are used for battery chargers in the products considered would typically have power values computed from the nameplate of 10W or less. The consultants report to CEC estimates that the product cost to consumers would be an incremental product cost of between $0.30 - $0.50.

12. Information made available to AHAM shows that the cost differential to the manufacturers would likely be several dollars, not the $0.30 to $0.50 estimated by the consultant. One source (see attached) from Astrodyne Corporation shows cost

differentials between linear power adaptors and switch mode adaptors of more than $15. This does not include the difference between manufacturing cost and the cost to the consumer. AHAM members have reported that their suppliers of appliance battery chargers have indicated increases of manufacturing costs to meet the proposed CEC regulations of 100 to 400%.

13. Consumers would therefore lose between $0.10 and $0.30 per unit product over the 7 years considered by the CASE study. Based upon the data of Table 1 depicting volume of units shipped in 2003, this would result in an annual aggregate impact of between $100,000 to $300,000 to the California consumers.

14. Considering that the costs to consumers are likely to be well above the amount shown by the CASE study, consumers would never recoup the additional cost of purchasing compliant products with any energy savings.